

REMARKS

Claims 1-15 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the remarks contained herein. These remarks clarify an improper inference made in the Office Action. Applicant submits the application is in condition for allowance and respectfully requests that the present comments be entered into the record.

REJECTION UNDER 35 U.S.C. § 102 – BOISSEAU

Claims 1-3 and 7-15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Boisseau et al. (U.S. Pat. App. Pub. No. 2002/0155278). This rejection is respectfully traversed.

The present invention contains features not found in the Boisseau reference. In particular, Boisseau does not teach at least one monomeric material that has a plurality of active hydrogen groups, as set out in independent claims 1 and 13. Instead, the film-forming component of Boisseau is polymeric or oligomeric. Boisseau paragraph [0048]. The written description of the present invention expressly uses the terms polymeric, oligomeric, and monomeric to describe separate species of materials. In fact, the written description specifically differentiates between polymeric and oligomeric materials versus monomeric materials, and further provides many exemplary monomeric materials which are illustrative of a monomeric material. Paragraphs [0004], [0007], and [0013] – [0027]. Consequently, the Boisseau reference does not contain a monomeric material as defined in the present disclosure, and the reference cannot therefore anticipate the present invention.

The present compositions and methods of independent claims 1 and 13 and their dependent claims all include a thermosetting, non-polymeric coating composition comprising, among other features, at least one monomeric material having a plurality of active hydrogen groups. The present compositions and methods are in contrast to very low molecular weight polymeric or oligomeric materials, which are particularly susceptible to sagging during the initial stages of baking (i.e., curing) due to their rheology profile on heating. Paragraph [0004].

Thus, the terms polymeric, oligomeric, and monomeric are used separately and distinctly in the present specification. The present specification distinguishes a monomeric material versus a polymeric or oligomeric material; therefore, when viewed by a skilled artisan, there is no confusion or inclusion of an oligomeric material within the meaning of a monomeric material.

In addition, a skilled artisan would not connote the oligomers of Boisseau as monomers. There is no confusion or overlap between oligomer and monomer as used in the present disclosure and claims. As typically recognized in the art, the term oligomer refers to short polymers, typically of a few monomer units:

The International Union of Pure and Applied Chemistry (IUPAC) defines oligomer as a substance composed of molecules containing a few of one or more species of atoms or groups of atoms (constitutional units) repetitively linked to each other (1). This does not specify an absolute degree of polymerization or molecular weight that distinguishes an oligomer from a polymer, but the IUPAC definition further states that the physical properties of an oligomer vary with the addition or removal of one or a few of the constitutional units from its molecules. This structure-property definition is perhaps the most meaningful definition of an oligomer. The conversion of a monomer or a mixture of monomers into an oligomer is defined as oligomerization. This definition does not imply any constraints on the oligomer polydispersity. Therefore, although monodisperse oligomers provide more valuable information than polydisperse oligomers, the latter are still important.

Furthermore, “[a] monomer is defined as a compound consisting of molecules each of which can provide one or more constitutional units of a polymer (or oligomer) (1).” Id at 25. Likewise, the illustrative examples of monomeric materials provided in the present disclosure in paragraphs [0013] – [0027] comport with these definitions and a skilled artisan would invariably conclude that a monomeric material (as used in independent claims 1 and 13) is not and does not include an oligomeric material.

The Boisseau et al. reference discloses coating compositions and coating methods having a film-forming component (a). The Boisseau film-forming component (a) may be polymeric or oligomeric and will generally comprise one or more compounds or components having a number average molecular weight of from 900 to 1,000,000, for example. Boisseau paragraph [0048]. Examples of polymer resins are listed in Boisseau paragraph [0051]. The molecular weight of polymers refers to the number average molecular weight (Boisseau paragraph [0052]); i.e., the number average molecular weight is the total weight of the sample divided by the number of molecules in the sample, thereby averaging a mixed population of polymers formed of different numbers of repeating subunits. Boisseau also discloses how to prepare polymers (for use as the film-forming component) from monomers. See Boisseau paragraph [0054]; see also paragraphs [0063] to [0098] for preferred carbamate functional polymers, polyester polymers, and polyurethane polymers. Furthermore, the only reference to monomers in Boisseau is in terms of using them to prepare polymers for use as the film-forming component. See Boisseau paragraphs [0052], [0054], and [0055].

Consequently, the Boisseau reference does not anticipate the present invention as it fails to include at least one monomeric material. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Since independent claims 1 and 13 are not anticipated, all dependent claims stemming therefrom are not anticipated. Withdrawal of the rejection and reconsideration of the claims are respectfully requested.

REJECTION UNDER 35 U.S.C. § 103 – BOISSEAU IN VIEW OF GREEN AND OHRBOM

Claims 1-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Boisseau et al. (U.S. Pat. App. Pub. No. 2002/0155278) in view of Green et al. (U.S. Pat. No. 5,872,195) and Ohrbom et al. (U.S. Pat. No. 5,756,213). Applicants respectfully traverse this rejection.

As detailed in traverse of the 102 rejection above, the Boisseau reference fails to teach at least one monomeric material that has a plurality of active hydrogen groups. Addition of the Green and Ohrbom references fails to cure this deficiency; the combination does not include the monomeric material of independent claims 1 and 13. Since the prior art reference (or references when combined) must teach or suggest all the claim limitations, claims 1 and 13, and their dependents, are not obvious. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974) (All the claim limitations must be taught or suggested by the prior art).

Furthermore, there is no suggestion or motivation in the combination of references to replace the film-forming component (i.e., the polymeric or oligomeric resin of Boisseau) with a monomeric material to make a non-polymeric coating composition with at least one monomeric material having a plurality of active hydrogen groups. These references do not appreciate use of the monomeric material in the present disclosure.

The Ohrbom reference describes a compound (A) that has a carbamate or urea functionality where a compound (A)(1) having a carbamate or urea group and a hydroxyl group is reacted with a compound (A)(2) which may be a dialkyl carbonate, cyclic carbonate, or CO₂. Reaction of (A)(1) with (A)(2) will result in a compound having the residues of two (or more) (A)(1) compounds linked together by a carbonate group formed from the residue of compound (A)(2). With inclusion of a polyol, a polycarbonate compound can be formed. Ohrbom col. 2, lines 19-34; see also col. 7, lines 52-67. Thus, at least two (A)(1) compounds are joined by an (A)(2) compound (i.e., at least two (A)(1) subunits/monomers are joined) and/or a polycarbonate polymer is formed. As a result, Ohrbom does not disclose a non-polymeric coating composition having a monomeric material as described in the present invention.

Green et al. discloses a curable coating composition having a polymer resin, curing agent, and a compound (c) having at least one carbamate group that is the reaction product of a hydroxyl group from a ring-opening reaction between an epoxy group and an organic acid group, and cyanic acid or a carbamate group. Green claim 1; abstract; col. 2, lines 1-11; and col. 5, lines 28-36. Thus, Green describes a polymeric coating composition where a polymer resin with active hydrogen-containing

functional groups reacts with a curing agent. The Green polymeric coating composition further contains a carbamate compound (c) that contains at least one carbamate group, but the primary film-forming component of Green is the polymer resin, examples of which are listed in col. 2, lines 14-27.

There is no suggestion or motivation that a skilled artisan would gather from the combination of Green, Boisseau, and Ohrbom that would lead to a non-polymeric coating composition having a monomeric material having a plurality of active hydrogen groups. In each reference (Green, Boisseau, and Ohrbom), the respective coating compositions contain a polymeric resin (Green), a film-forming component (Boisseau), or at least two of the same compound linked that can further include polycarbonates (Ohrbom), where each in turn reacts with a crosslinker.

The carbamate compound (c) from Green is further differentiated from the monomeric material of the present invention in that since compound (c) can have just one carbamate group, it would then react with a crosslinker at only the single carbamate moiety. As such, the cured coating composition in Green would be very different from the cured coating composition of the present invention where a non-polymeric coating composition having a monomeric material with a plurality (i.e., at least 2) of active hydrogen groups reacts with a crosslinker.

Thus, the present invention identifies and utilizes a specific species of carbamate containing compounds (i.e., monomeric materials having at least two carbamates) that are necessary for the present invention. A monomeric material having a single carbamate group would not function in a similar fashion and is not included in the presently claimed invention. Therefore, the monomeric material having a plurality of

active hydrogen groups would not have been obvious in the combination of the aforementioned references, since each of the references contains a separate polymeric resin which can react with a crosslinker to provide a polymerized and cured coating. Addition of a single carbamate containing compound (c) from the Green reference can react with a crosslinker, but cannot participate in the same type of curing reaction as can the monomeric material having a plurality of active hydrogen groups of the present invention.

Since there is no suggestion or motivation to remove the polymeric resins from the prior art references, and no suggestion or motivation to then use a monomeric material with a plurality (at least two) of reactive hydrogen groups in a non-polymeric coating composition, the present invention is not obvious. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure.). Withdrawal of the rejection and reconsideration of the claims are respectfully requested.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: October 25, 2006

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